STEREO GRAPHIC EQUALIZER

GE-540

SERVICE MANUAL

KENWOOD

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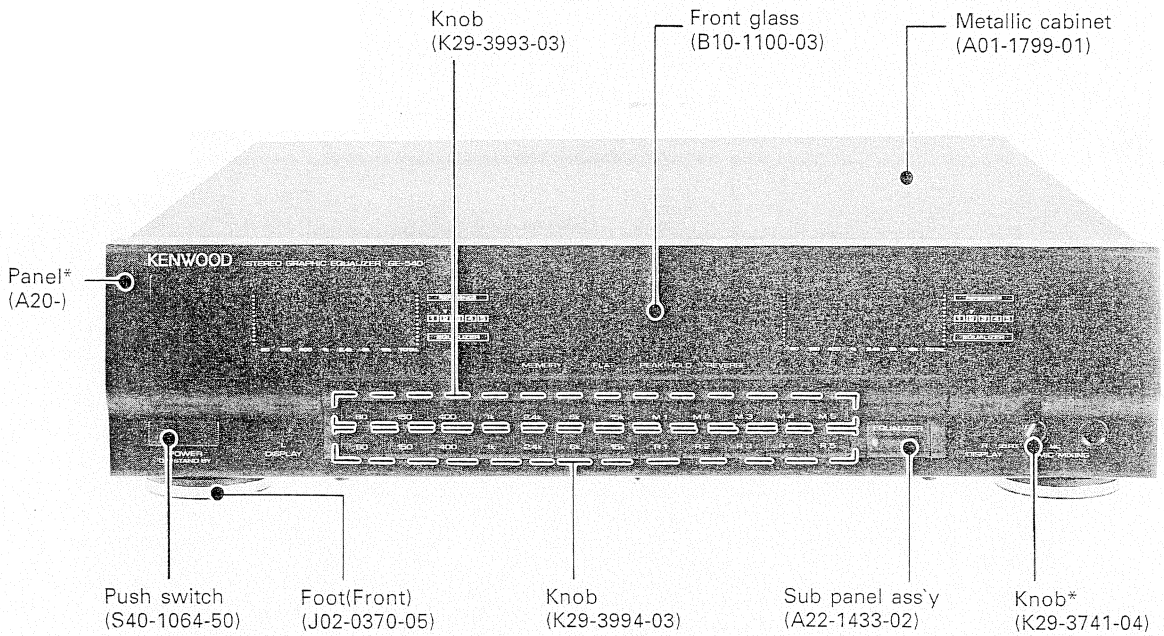
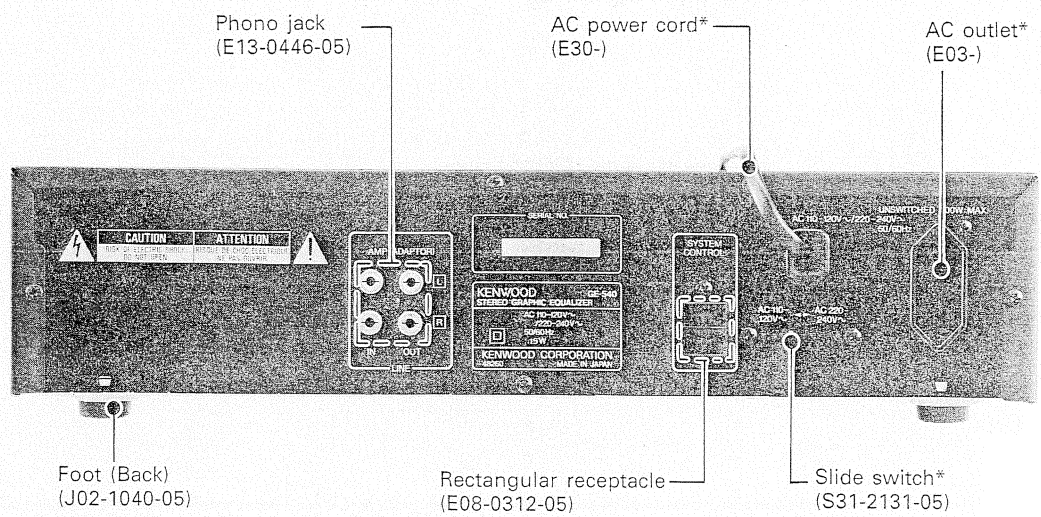
B51-4206-00 (O) 1953





* Refer to parts list on page 12.

CONTENTS / ACCESSORIES

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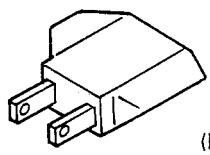
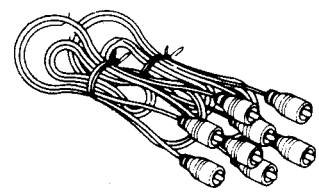
Accessories

AC plug adaptor 1



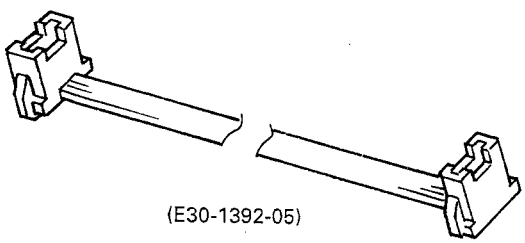
(E03-0115-05)

Audio cord 2



(E30-0505-05)

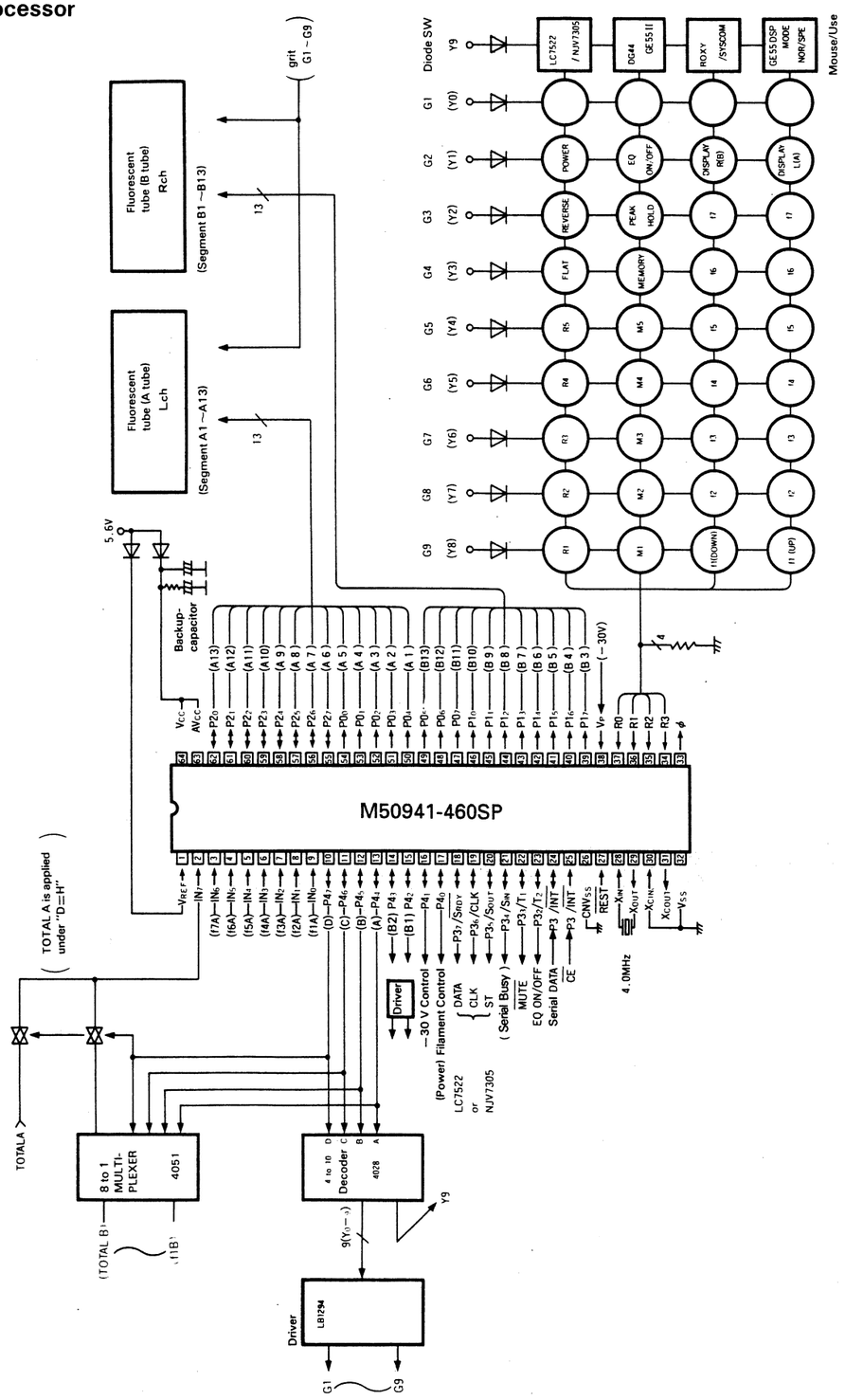
System control cord 1



(E30-1392-05)

CIRCUIT DESCRIPTION

Microprocessor



GE-540

CIRCUIT DESCRIPTION

Pin Description

Pin No.	Pin name	I/O	Name	Description
1	VREF			Power supply for A/D converter (5V).
2	IN7	I		A/D input for multiplexer and L-ch TOTAL signal.
3~9	IN6~IN0	I	f7A~f1A	A/D input of L-ch.
10~13	P47~P44	O	D~A	Control for multiplexer and 4 to 10 decoder.
14, 15	P43, P42	O	B2, B1	Drive for R-ch segments.
16	P41	O		Control power supply for indicator (−30 V) L: ON, H: OFF.
17	P40	O		Control power supply for filament of Indicator L: OFF, H: ON.
18	P37	O	DATA	Data terminal for LC722.
19	P36	O	CLK	Clock terminal for LC722.
20	P35	O	ST	ST terminal for LC722.
21	P34	I/O	S BUSY	Serial Busy I/O.
22	P33	O	$\overline{\text{MUTE}}$	Control mute when power is ON/OFF and EQ is ON/OFF L: ON, H: OFF.
23	P32	O	EQ ON/OFF	Control EQ circuit L: OFF, H: ON.
24	P31	I	S. DATA	Synchro-data input.
25	P30	I	$\overline{\text{CE}}$	Detection of Backup L: BACKUP.
26	CNVSS			Mode change in microprocessor. (GND)
27	$\overline{\text{RESET}}$			Reset terminal L: RESET.
28, 29	XIN, XOUT			System clock terminal (4 MHz).
30, 31	XCIN, XCOUT			No use.
32	Vss			GND of power supply.
33	ϕ			1/4-divider of system clock (no use).
34~37	R3~R0	I		Key inputs.
38	VP			Pull-down power supply (−30 V).
39~49	P17~P05	O	B3~B13	Drive segments (3~13) of R-ch.
50~62	P04~P20	O	A1~A13	Drive segments (3~13) of L-ch.
63	AVcc			Power supply for A/D converter (5 V).
64	Vcc			Power supply for microprocessor (5 V).

<TEST MODE>

1. **Insert AC plug to the power supply under pressing FLAT key. (RESET mode)**
2. **Confirm the following checks.**

2-1. At first, all of segments turn on.
2-2. MAX segments (+12 dB) of all frequency turn on when pressing M-2 key.
2-3. Min segments (−12 dB) of all frequency turn on when pressing M-3 key.
2-4. 3 points (+12 dB, 0 dB, −12 dB) of segments turn on in all frequency when UP or DOWN key is pressed.

3. **Pull the AC plug out when power switch on (reset).**

Factory shipment setting

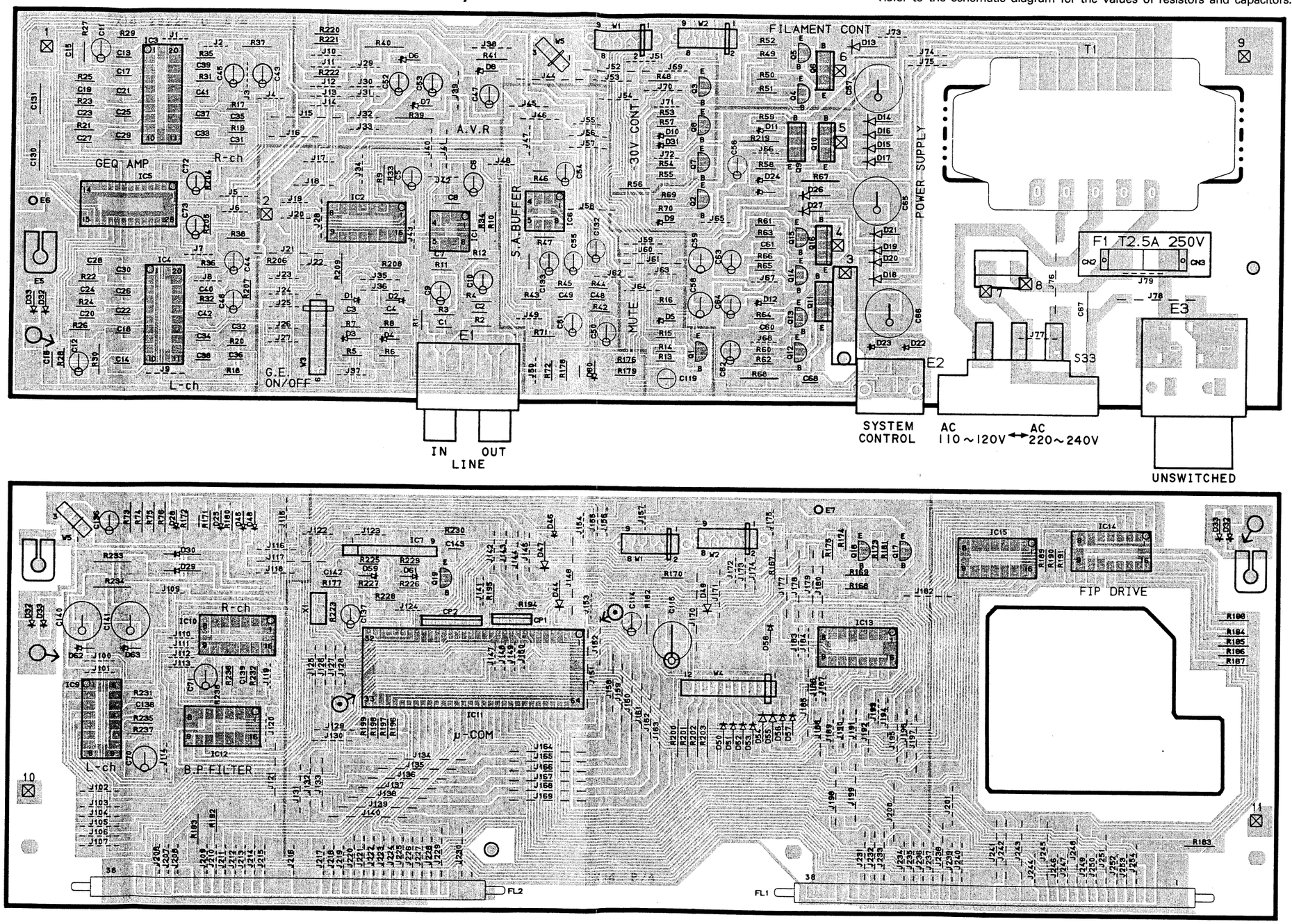
- EQ Memory Mode : MANUAL
- EQ : 0dB, all flat
- Contents of MANUAL EQ Memory : M1 to M5 are initialized curve
- EQ ON/OFF : OFF
- Display Mode : Spectrum
- Peak Hold ON/OFF : ON

How to set factory shipment setting

- Discharge backup capacitor
- Insert AC plug to the power supply under pressing EQ MOMORY key

PC BOARD (COMPONENT SIDE VIEW)

Refer to the schematic diagram for the values of resistors and capacitors.

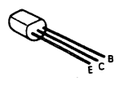


(X14-2922-70) (A/4)

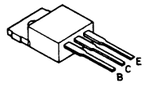
(X14-2922-70) (B/4)

(X14-2922-70) (C/4)

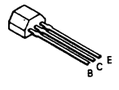
2SA733(A)
2SC945(A)



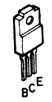
2SD1266



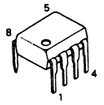
2SA933S
2SC1740S



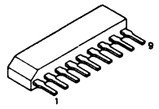
2SB941



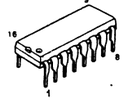
NJM4560D
NJM4580D-D



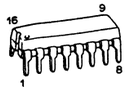
AN6913



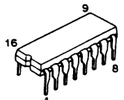
XR-1091DCP



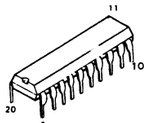
LB1294



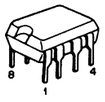
TC4051BP
TC9215P
TC4028BP



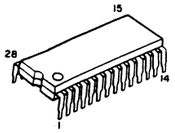
M5229P



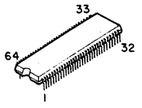
μPC4570C-A

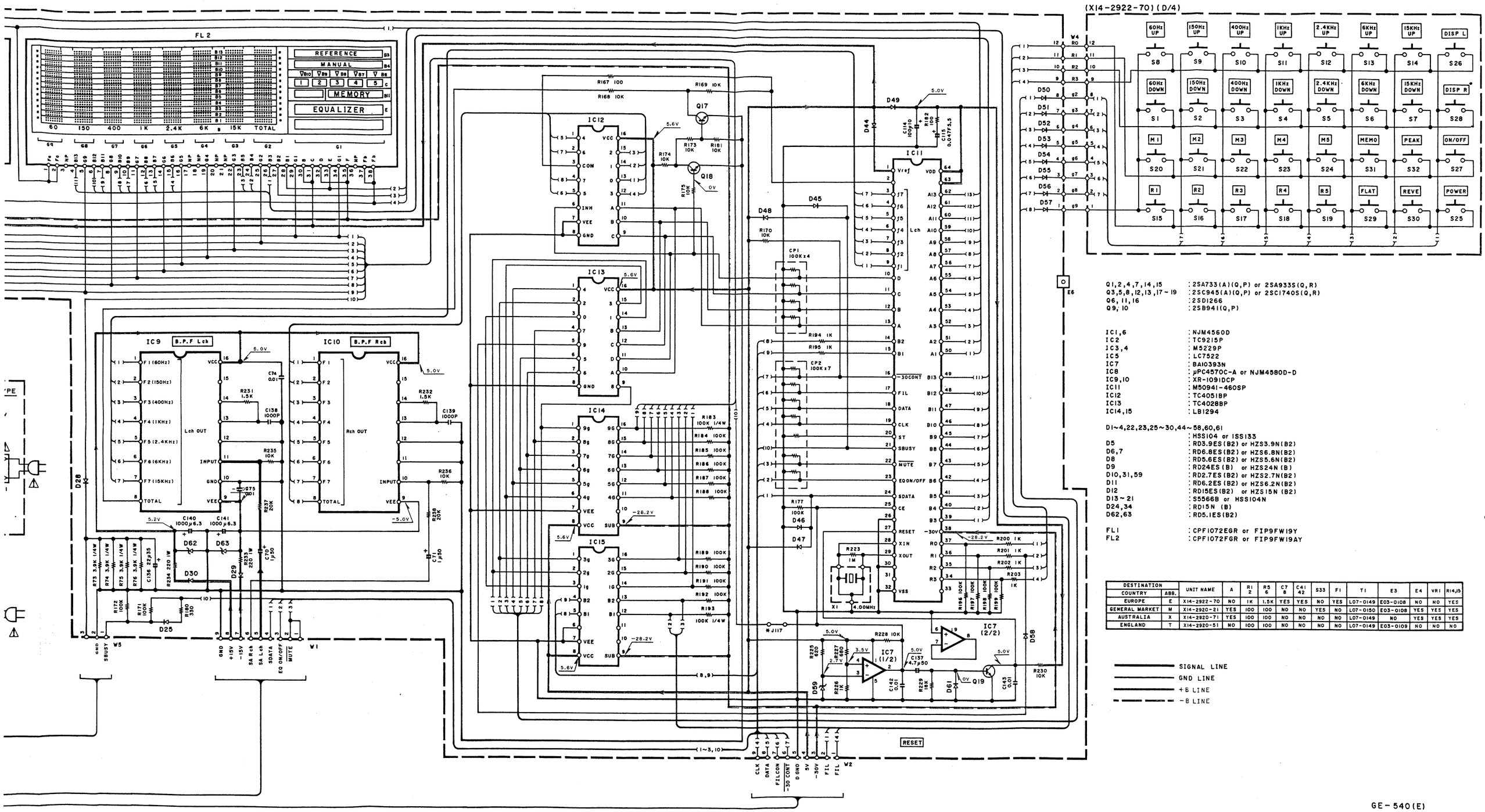


LC7522



M50941-460SP





Q1,2,4,7,14,15	: 2SA733(A)(Q,P) or 2SA933S(Q,R)
Q3,5,8,12,13,17~19	: 2SC945(A)(Q,P) or 2SC1740S(Q,R)
Q6, 11, 16	: 2SD1266
Q9, 10	: 2SB941(Q,P)
IC1,6	: NJM4560D
IC2	: TC9215P
IC3,4	: M5229P
IC5	: LC7522
IC7	: BA10393N
IC8	: μPC4570C-A or NJM4580D-D
IC9,10	: XR-1091DCP
IC11	: M50941-460SP
IC12	: TC4051BP
IC13	: TC4028BP
IC14,15	: LB1294
D1~4,22,23,25~30,44~58,60,61	: HSS104 or ISS133
D5	: RD3.9ES(B2) or HZS3.9N(B2)
D6,7	: RD6.8ES(B2) or HZS6.8N(B2)
D8	: RD5.6ES(B2) or HZS5.6N(B2)
D9	: RD24ES(B) or HZS24N(B)
D10,31,59	: RD2.7ES(B2) or HZS2.7N(B2)
D11	: RD6.2ES(B2) or HZS6.2N(B2)
D12	: RD15ES(B2) or HZS15N(B2)
D13~21	: S5566B or HSS104N
D24,34	: RD15N (B)
D62,63	: RD5.1ES(B2)
FL1	: CPF1072EGR or FIP9FW19Y
FL2	: CPF1072FGR or FIP9FW19AY

DESTINATION		UNIT NAME	A	R1 2	R5 6	C7 8	C41 42	S33	F1	T1	E3	E4	VR1	R14,15
COUNTRY	ABB.													
EUROPE	E	X14-2922-70	NO	1K	1.5K	YES	YES	NO	YES	L07-0149	E03-0108	NO	NO	YES
GENERAL MARKET	M	X14-2920-21	YES	100	100	NO	NO	YES	NO	L07-0150	E03-0108	YES	YES	YES
AUSTRALIA	X	X14-2920-71	YES	100	100	NO	NO	NO	NO	L07-0149	NO	YES	YES	YES
ENGLAND	T	X14-2920-51	NO	100	100	NO	NO	NO	NO	L07-0149	E03-0109	NO	NO	NO

SIGNAL LINE
GND LINE
+B LINE
-B LINE

GE-540(E)

CAUTION : For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list). ⚠ Indicates safety critical components. To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.

- DC voltages are as measured with a high impedance voltmeter. Values may vary slightly due to variations between individual instruments or/and units.

Y09-3522-70

GE-540

EXPLODED VIEW

Parts with the exploded numbers larger than 700 are not supplied.

PARTS LIST

* New Parts
Parts without Parts No. are not supplied.
Les articles non mentionnes dans le Parts No. ne sont pas fournis.
Teile ohne Parts No. werden nicht geliefert.

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
GE-540						
601	1B		A01-1799-01	METALLIC CABINET		
602	3A	*	A20-6097-02	PANEL	ET	
602	3A	*	A20-6098-02	PANEL	MX	
603	2A	*	A22-1433-02	SUB PANEL ASSY		
610	2A	*	B10-1100-03	FRONT GLASS		
-			B46-0096-13	WARRANTY CARD	X	
-			B46-0122-13	WARRANTY CARD	E	
-			B46-0143-13	WARRANTY CARD	T	
-			B58-0803-13	CAUTION CARD	E	
-		*	B60-0189-00	INSTRUCTION MANUAL(ENGLISH)		
-		*	B60-0190-00	INSTRUCTION MANUAL(F/D/G/I)	E	
-		*	B60-0191-00	INSTRUCTION MANUAL(SP/CH)	M	
615	1A		E03-0115-05	AC PLUG ADAPTER	M	
616	1A		E30-0505-05	AUDIO CORD		
617	1A		E30-1392-05	CORD WITH PLUG		
618	1B		E30-2592-15	AC POWER CORD	EM	
618	1B		E30-2594-15	AC POWER CORD	X	
618	1B	*	E30-2602-05	AC POWER CORD	T	
623	2A		G11-0191-04	SOFT TAPE (90X5X2.5)		
624	1A	*	G11-1050-04	SOFT TAPE		
-		*	H01-8834-04	ITEM CARTON CASE		
-			H10-5040-02	POLYSTYRENE FOAMED FIXTURE		
-			H25-0224-04	PROTECTION BAG (800X400X0.03)		
-			H25-0232-04	PROTECTION BAG (235X350X0.03)		
628	3B		J02-0370-05	FOOT (FRONT)		
629	3A		J02-1040-05	FOOT (REAR)		
630	3B	*	J19-3314-04	HOLDER		
631	2B,3B	*	J21-5634-04	MOUNTING HARDWARE		
632	1B		J42-0083-05	POWER CORD BUSHING		
635	3A		K29-3741-04	KNOB (MIC)	MX	
636	2A	*	K29-3993-03	KNOB		
637	2A	*	K29-3994-03	KNOB		
A			N29-0216-05	RIVET		
B			N89-3018-41	BINDING HEAD TAPTITE SCREW		
C			N89-3008-46	BINDING HEAD TAPTITE SCREW		
D			N89-3008-45	BINDING HEAD TAPTITE SCREW		
ELECTRIC UNIT (X14-2922-70 : E, 0-21 : M, 0-71 : X, 0-51 : T)						
C1 -4			CC45FSL1H221J	CERAMIC 220PF J		
C5 ,6			CE04KW1V100M	ELECTRO 10UF 35WV		
C7 ,8			CC45FSL1H101J	CERAMIC 100PF J	E	
C9 -12			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C13 ,14			CF92FV1H224J	MF 0.22UF J		
C15 ,16			CF92FV1H474J	MF 0.47UF J		
C17 ,18			CF92FV1H913J	MF 0.091UF J		
C19 ,20			CF92FV1H184J	MF 0.18UF J		
C21 ,22			CF92FV1H333J	MF 0.033UF J		
C23 ,24			CF92FV1H683J	MF 0.068UF J		
C25 ,26			CF92FV1H133J	MF 0.013UF J		
C27 ,28			CF92FV1H303J	MF 0.030UF J		
C29 ,30			CF92FV1H562J	MF 5600PF J		
C31 ,32			CF92FV1H123J	MF 0.012UF J		

E: Scandinavia & Europe K: USA P: Canada W:Europe
Y : PX(Far East, Hawaii) T: England M: Other Areas
Y : AAFES(Europe) X: Australia

⚠ indicates safety critical components.

GE-540

PARTS LIST

* New Parts
Parts without Parts No. are not supplied.
Les articles non mentionnes dans le Parts No. ne sont pas fournis.
Teile ohne Parts No. werden nicht geliefert.

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
C33 ,34			CF92FV1H222J	MF 2200PF J		
C35 ,36			CF92FV1H472J	MF 4700PF J		
C37 ,38			CK45FB1H821K	CERAMIC 820PF K		
C39 ,40			CK45FB1H471K	CERAMIC 470PF K		
C41 ,42			CC45FSL1H221J	CERAMIC 220PF J	E	
C43 -46			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C47			CE04KW1A101M	ELECTRO 100UF 10WV		
C48 ,49			CC45FSL1H101J	CERAMIC 100PF J		
C50 ,51			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C52 ,53			CE04KW1A101M	ELECTRO 100UF 10WV		
C54 ,55			CE04KW1V4R7M	ELECTRO 4.7UF 35WV		
C56			CE04KW1A101M	ELECTRO 100UF 10WV		
C57			CE04KW1H471M	ELECTRO 470UF 50WV		
C58 ,59			CE04KW1C101M	ELECTRO 100UF 16WV		
C60 ,61			CK45FB1H102K	CERAMIC 0.001UF K		
C62 ,63			CE04KW1V220M	ELECTRO 22UF 35WV		
C64			CE04KW1C101M	ELECTRO 100UF 16WV		
C65 ,66			CE04KW1V102M	ELECTRO 1000UF 35WV		
C67			C91-0647-05	CERAMIC 0.01UF P		
C68			CK45FF1H223Z	CERAMIC 0.022UF Z		
C70 ,71			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C72 ,73			CE04KW1H100M	ELECTRO 10UF 50WV		
C114			CE04KW1A101M	ELECTRO 100UF 10WV		
C115			C90-1827-05	BACKUP 0.047F 5.5WV		
C119			C90-1349-05	NP-ELEC 1UF 50WV		
C120			CK45FF1H472Z	CERAMIC 4700PF Z	MX	
C121			CC45FSL1H221J	CERAMIC 220PF J	MX	
C122			CF92FV1H473J	MF 0.047UF J	MX	
C123			CE04KW1V100M	ELECTRO 10UF 35WV	MX	
C124			CC45FSL1H221J	CERAMIC 220PF J	MX	
C125			CK45FB1H102K	CERAMIC 0.001UF K	MX	
C126,127			CE04KW1V100M	ELECTRO 10UF 35WV	MX	
C128,129			CE04KW1C101M	ELECTRO 100UF 16WV	MX	
C130,131			C91-0769-05	CERAMIC 0.01UF K		
C132,133			CE04KW1A470M	ELECTRO 47UF 10WV		
C136			CE04KW1V220M	ELECTRO 22UF 35WV		
C137			CE04KW1H4R7M	ELECTRO 4.7UF 50WV		
C138,139			CK45FB1H102K	CERAMIC 0.001UF K		
C140,141			CE04DW0J102M	ELECTRO 1000UF 6.3WV		
C142,143			CK45FF1H103Z	CERAMIC 0.010UF Z		
E1			E13-0446-05	PHONO JACK (4P)		
E2			E08-0312-05	RECTANGULAR RECEPTACLE		
E3			E03-0108-05	AC OUTLET	EM	
E3			E03-0109-05	AC OUTLET	T	
E4			E11-0159-05	PHONE JACK (3P)MIC	MX	
F1			F05-2525-05	FUSE (SEMKO) (250V T2.5A)	E	
CN2 ,3			J13-0075-05	FUSE CLIP	E	
T1		*	L07-0149-05	POWER TRANSFORMER	EXT	
T1		*	L07-0150-05	POWER TRANSFORMER	M	
X1			L78-0244-05	RESONATOR (4.00MHz)		
D			N89-3008-45	BINDING HEAD TAPTITE SCREW		
E			N35-3008-46	BINDING HEAD MACHINE SCREW		

E: Scandinavia & Europe K: USA P: Canada W:Europe
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⚠ indicates safety critical components.

PARTS LIST

* New Parts
Parts without Parts No. are not supplied.
Les articles non mentionnes dans le Parts No. ne sont pas fournis.
Teile ohne Parts No. werden nicht geliefert.

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
CP1			R90-0482-05	MULTI-COMP 100KX4 J 1/6W		
CP2			R90-0803-05	MULTI-COMP 100KX7 J 1/4W		
R39 ,40		*	RD14NB2E561J	RD 560 J 1/4W		
R67 ,68			RS14KB3A271J	FL-PROOF RS 270 J 1W		
R217,218			RD14NB2E100J	RD 10 J 1/4W	MX	
R219			RD14NB2E101J	RD 100 J 1/4W		
R233,234			RS14KB3A221J	FL-PROOF RS 220 J 1W		
VR1		*	R10-5040-05	POTENTIOMETER(100K 10C X2)	MX	
S1 -32			S40-1064-05	PUSH SWITCH		
S33			S31-2131-05	SLIDE SWITCH (POWER TYPE)	M	
D1 -4			HSS104	DIODE		
D1 -4			1SS133	DIODE		
D5			HZS3.9N(B2)	ZENER DIODE		
D5			RD3.9ES(B2)	ZENER DIODE		
D6 ,7			HZS6.8N(B2)	ZENER DIODE		
D6 ,7			RD6.8ES(B2)	ZENER DIODE		
D8			HZS5.6N(B2)	ZENER DIODE		
D8			RD5.6ES(B2)	ZENER DIODE		
D9			HZS24N(B)	ZENER DIODE		
D9			RD24ES(B)	ZENER DIODE		
D10			HZS2.7N(B2)	ZENER DIODE		
D10			RD2.7ES(B2)	ZENER DIODE		
D11			HZS6.2N(B2)	ZENER DIODE		
D11			RD6.2ES(B2)	ZENER DIODE		
D12			HZS15N(B2)	ZENER DIODE		
D12			RD15ES(B2)	ZENER DIODE		
D13 -21			S5566B	DIODE		
D22 ,23			HSS104	DIODE		
D22 ,23			1SS133	DIODE		
D24			HZS30N(B)	ZENER DIODE		
D24			RD30ES(B)	ZENER DIODE		
D25 -30			HSS104	DIODE		
D25 -30			1SS133	DIODE		
D31			HZS2.7N(B2)	ZENER DIODE		
D31			RD2.7ES(B2)	ZENER DIODE		
D44 -58			HSS104	DIODE		
D44 -58			1SS133	DIODE		
D59			HZS2.7N(B2)	ZENER DIODE		
D59			RD2.7ES(B2)	ZENER DIODE		
D60 ,61			HSS104	DIODE		
D60 ,61			1SS133	DIODE		
D62 ,63			HZS5.1N(B2)	ZENER DIODE		
D62 ,63			RD5.1ES(B2)	ZENER DIODE		
FL1			CPF1072EGR	FLUORESCENT INDICATOR TUBE		
FL1			FIP9FW19Y	FLUORESCENT INDICATOR TUBE		
FL2			CPF1072FGR	FLUORESCENT INDICATOR TUBE		
FL2			FIP9FW19AY	FLUORESCENT INDICATOR TUBE		
IC1			NJM4560D	IC(OP AMP X2)		
IC2			TC9215P	IC(ANALOG SWITCH X 6)		
IC3 ,4			M5229P	IC(7CH GRAPHIC EQUALIZER)		
IC5			LC7522	IC(7CH GRAPHIC EQUALIZER)		
IC6			NJM4560D	IC(OP AMP X2)		
IC7			AN6913	IC(COMPARATOR X2)		
IC8			NJM4580D-D	IC	MX	

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IC8			UPC4570C-A	IC	MX	
IC9 ,10		*	XR-1091DCP	IC(GE DISPLAY FILTER)		
IC11		*	M50941-460SP	IC(MICROPROCESSOR)		
IC12			TC4051BP	IC(8CH MPX/ DE-MPX)		
IC13			TC4028BP	IC		
IC14,15			LB1294	IC(6CH DARLINGTON DRIVER)		
Q1 ,2			2SA733(A)(Q,P)	TRANSISTOR		
Q1 ,2			2SA933S(Q,R)	TRANSISTOR		
Q3			2SC1740S(Q,R)	TRANSISTOR		
Q3			2SC945(A)(Q,P)	TRANSISTOR		
Q4			2SA733(A)(Q,P)	TRANSISTOR		
Q4			2SA933S(Q,R)	TRANSISTOR		
Q5			2SC1740S(Q,R)	TRANSISTOR		
Q5			2SC945(A)(Q,P)	TRANSISTOR		
Q6			2SD1266	TRANSISTOR		
Q7			2SA733(A)(Q,P)	TRANSISTOR		
Q7			2SA933S(Q,R)	TRANSISTOR		
Q8			2SC1740S(Q,R)	TRANSISTOR		
Q8			2SC945(A)(Q,P)	TRANSISTOR		
Q9 ,10			2SB941(Q,P)	TRANSISTOR		
Q11			2SD1266	TRANSISTOR		
Q12 ,13			2SC1740S(Q,R)	TRANSISTOR		
Q12 ,13			2SC945(A)(Q,P)	TRANSISTOR		
Q14 ,15			2SA733(A)(Q,P)	TRANSISTOR		
Q14 ,15			2SA933S(Q,R)	TRANSISTOR		
Q16			2SD1266	TRANSISTOR		
Q17 -19			2SC1740S(Q,R)	TRANSISTOR		
Q17 -19			2SC945(A)(Q,P)	TRANSISTOR		

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SPECIFICATIONS

Equalizer characteristic

Variable range	±12dB
Center frequencies	60Hz, 150Hz, 400Hz, 1kHz, 2,4kHz, 6kHz, 15kHz
Total harmonic distortion	Less than 0.006% (1kHz)
Maximum output voltage	9V (1kHz)
S/N ratio	100dB (IHF-A network, 1V)
Input impedance	47kΩ
Output impedance	2.2kΩ

General

Dimensions	W 360 x H 109 x D 353 (mm)
Weight	3.1kg

Note : KENWOOD follows a policy of continuous advancements in development. For this reason specifications may be changed without notice.

Note :
Component and circuitry are subject to modification to insure best operation under differing local conditions. This manual is based on, the Europe (E) standard, and provides information on regional circuit modification through use of alternate schematic diagrams, and information on regional component variations through use of parts list.